TIBBETTS AWARD NOMINATION

Basic Information Cover Sheet

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NOMINATION STATEMENT

Kelly Space & Technology, Inc. (KST) is in business to make commercial access to space affordable and routine via KST's reusable Eclipse launch system and patented Tow Launch Technology. Michael Kelly and Michael Gallo founded the San Bernardino, California-based company in 1993 to "commercially provide the lowest cost, most reliable and fastest response access to space without dependence upon government subsidy."

The two former TRW colleagues have structured their company's business model to mirror an air-freight operation. The cargo/payload currently involves communications satellites. The KST patented Eclipse Tow Launch Technology will enable communications companies to deliver their satellites into space economically, which will enhance the public's ability to communicate by cell phone worldwide and access an even bigger Internet. Ultimately, KST's approach could lead to delivering same-day international packages within three hours, and the general public being able to travel in space.

The KST piloted Eclipse Reusable Launch Vehicle (RLV) will operate like an airplane, taking off from and landing at a conventional runway. During takeoff and initial flight the Eclipse will be an unpowered glider, and will be towed to launch altitude behind a transport aircraft. This novel Tow Launch Technology is responsible for most of the Eclipse's competitive advantages.

KST demonstrated its Eclipse Tow Launch Technology in a series of six successful flight tests, which ran from December 1997 through February this year, at NASA's Dryden Flight Research Center at Edwards Air Force Base in Edwards, California. The Tow Launch demonstration flights were conducted by KST, in cooperation with NASA Dryden Flight Research Center and the Air Force Flight Test Center under a Small Business Innovation Research (SBIR) contract awarded by the Air Force Research Laboratory (AFRL), formerly the USAF Phillips Laboratory.

As a result of the Phase I and Phase 11 SBIR funds awarded to KST to demonstrate its Eclipse Tow Launch Technology, the company's viability and credibility increased, producing the following accomplishments:

Economic Impact of technological innovation

- KST has been awarded an $89 million contract by Motorola to launch 20 communications satellites into orbit for the Iridium satellite-based, global personal communications system, which Motorola is developing.

- KST and its affiliated companies have employed more than 30 individuals; KST officials project the creation of several hundred jobs locally in San Bernardino, California at KST's headquarters at the San Bernardino International Airport (the former Norton Air Force Base) and in the Southern California region to design, develop and operate the KST Eclipse family of launch vehicles. KST officials also anticipate job creation in the states of Arizona and New Jersey where KST will conduct additional flight operations at Williams Gateway Airport (the former Williams Air Force Base) to support KST's Motorola contract and at Atlantic City International Airport (the former Pomona Air Force Base) for KST's East Coast launch operations. KST is presently involved in planning with the Eastern and Western Test Ranges (Cape Kennedy and Vandenberg Air Force Base) for future launch support operations.

- The commercial launch industry is taking strong interest in KST's ability to offer the satellite community launch prices at one-third to two-thirds of the current market, depending upon the contracted number of launches. Current costs to place a satellite in Low Earth Orbit range from $5,000 to $15,000 per pound of payload. The average cost to launch a payload on the Space Shuttle or a military missile booster currently is $8,000 per pound. KST proposes to reduce this to a cost of less than $2,000 per pound using its patented Tow Launch Technology and Eclipse (RLV).

- Insurance and launch industry officials are noting KST's ability to offer lower satellite deployment costs because of KST's reduced insurance rates. Lloyds of London underwriters have assessed launch insurance rates for KST Eclipse payloads at well below the standard 7 to 22 percent for payloads on existing expendable launch systems.

- KST's Eclipse Tow Launch Technology, coupled with its Eclipse vehicle's reusability, lowers cost and increases flexibility well beyond that for fixed-site, expendable or weight-limited airborne launch systems. Providing low-cost space transportation will make more economically feasible communications, weather forecasting, geographical observation, and scientific experimentation. KST is addressing many new and exciting lines of business in addition to satellite launches. These include: micro-gravity experiments in the medical, pharmaceutical and science fields; launch of targets to support various military programs; rapid package delivery throughout the world; and passenger service to space.

Business Achievement

In his keynote address at KST's Eclipse Inauguration Program two years ago, NASA Administrator Daniel Goldin encouraged commercialization of space through free enterprise, and congratulated Michael Kelly, Michael Gallo and the rest of the KST team for being able to "pursue a dream and change the future of this country in space."

- KST was issued a U.S. patent for its Tow Launch Technology, which company officials say is key to making commercial access to space affordable and routine via KST's reusable Eclipse launch system. "The KST Eclipse Tow Launch Technology represents a major step forward in the advancement of reliable low-cost access to space and is the most efficient means of launch that has yet been devised," says its inventor Michael Kelly.

- KST and Motorola Satellite Communications Group signed a launch services contract for 10 flights of KST's Eclipse orbital launch vehicle, in support of the Iridium Low-Earth-Orbit cellular communications program. The Eclipse flights will carry a total of 20 satellites into space during the Operations and Maintenance phase of the Iridium program. Total value of the contract is $89 million. According to Michael Kelly, KST president and CEO, calls the contract a "landmark in the development of the commercial space launch industry because it mars the first time a commercial satellite company has been willing to commit to fly on an entirely new launch vehicle."

- KST co-founders Michael Kelly and Michael were nominated by the Riverside, California-based U.S. Small Business Administration office, serving Riverside and San Bernardino counties in California, and won the Ernst & Young 1997 "Entrepreneur of the Year" award in the "Emerging" category in the Inland Empire (California) regional competition.

- Last year, KST awarded Eclipse Space Lines (ESL) the license to conduct operational flight services for KST's first sub-orbital launch vehicle, known as the Sprint, using KST's patented Tow Launch Technology. In tam, the San Bernardino, California-based ESL has contracted with KST to develop and build the Sprint, which ESL will own and operate.

- In 1995, KST won a SBIR Phase I contract award from the AFRL to demonstrate analytically the viability of its new technology. The success of this effort was followed by a Phase 11 SBIR contract award to demonstrate the technology in a series of flight tests, which were completed with outstanding success this past February.

- KST has secured sufficient private investment and financial commitments to begin design, development and production of the first of its launch vehicles, the Sprint. In addition, several institutions have committed to fund the entire development and construction of KST's flagship, the Eclipse Astroliner, pending firm launch contracts.

- KST officials recently met with several potential customers to update them on the company's achievement of numerous milestones. According to Michael Kelly, "The meetings have been encouraging. The satellite customer community is telling us that the features of the KST Eclipse launch system satisfy their commercial launch demands. "

- KST founder Michael Kelly testified before Congress last year and this year that it should not finance commercial launch service providers. In his testimony to the Subcommittee on Space and Aeronautics for the U.S. House of Representatives Committee on Science last May, Kelly said, "When it comes to federal purchase of commercial launch services, I believe the government should buy commercial space transportation services, when appropriate, on the exact same basis as it does any other transportation service -- no more, and no less. It should not continue the practice of financing commercial launch service providers with taxpayer's money."

KST is developing an increasing presence in the Commercial Space Transportation business and currently is considered on of the front-runners amount a handful of small, entrepreneurial RLV developers. KST's founder Michael Kelly is a member of the prestigious Commercial Space Transportation Advisory Committee and the inaugural chairperson of the RLV Working Group. In these capacities, KST will be a major contributor to the formulation of regulations to support this new industry and will work closely with the Federal Aeronautics Administration Commercial Space Transportation Agency in this endeavor.

Effective collaborations

- The successful accomplishment of KST's Phase II SBIR contract award required the marshaling of many diverse resources, which included: three major Air Force commands consisting of 11 separate organizations; two NASA centers; and five sub-contractors. Overall program management was provided by the SBIR sponsor, AFRL. Successful completion of the SBIR Phase II Eclipse Experimental Demonstrator program provides an example of government and industry cooperation which is unparalleled.

- The Air Combat Command provided two surplus F-106 aircraft to KST to be modified for service as the test article by installing a tow/release mechanism and performing other minor modifications.

- NASA Dryden Flight Research Center provided KST with analysis and simulation support, performed all F-106 maintenance operations and modifications using hardware designed and provided by KST, and provided all F-106 instrumentation. NASA Dryden also provided the F-106 pilot, chase planes, pilots and test range support, and served as the Responsible Test Organization. This NASA support was provided under a no-funds-exchange Space Act Agreement.

- NASA Langley provided the basic flight test simulation program which NASA Dryden modified to simulate the towed and towing aircraft combination connected by a tow rope.

- The Air Force Flight Test Center at Edwards Air Force Base provided the C-141 tow aircraft and crew as well as general test support and management for all C-141 activities.

- The Air Logistics Command provided all logistic support.

- KST originated the concept and provided program management, and system and hardware design, supported by the five subcontractors who provided analysis, fabrication and test support.

Demonstrated State and Regional Impact (also see Economic Impact heading)

- Along with job creation identified under the economic impact referenced in the first bullet heading, KST has taken a leadership role in bringing job growth in the high tech field to the Inland Empire comprised of Riverside and San Bernardino counties. KST is a founding member of the Inland Empire Technology Entrepreneurs, whose mission is to retain and attract high tech companies to the area, encourage government cooperation for such companies, and mentor area educational institutions to produce skilled laborers for local hiring.

- KST was awarded the maximum permissible grant from the Los Angeles Regional Technology Alliance and the State of California's Defense Conversion Council.

Proven Support

Although supported by the community at large, and in spite of the fact that Motorola awarded an $89 million contract to KST for the launch of 20 satellites, the proposed KST Tow Launch Technology initially was met with skepticism by some within both NASA and the Air Force. It required vision and courage on the part of the AFRL, NASA Dryden, AFFRC and the other participants to provide such splendid support in the face of this skepticism. Fortunately for KST and the future of commercial space transportation, their prestigious support has lent further credibility to the KST Tow Launch Technology.

KST presently is working with the AFRL in processing a Cooperative Research and Development Agreement (CRDA) for a program to perform test launches of a reusable second stage being developed by the AFRL. These tow launches would be performed using two versions of the F-106 used in the SBIR Phase 11 demonstration program; one would be jet-powered and one would be rocket-powered. To support this and other future programs, AFRL is sponsoring KST in the acquisition of the remaining F-106 assets, some to be provided as GFP, the remainder by outright purchase by KST.

KST has received much proven support from industry and government leaders. More than 1,000 people attended the KST Eclipse Inauguration Program held two years ago to formally introduce the company's launch system and family of reusable launch vehicles, and announce its $89 million Iridium launch services contract awarded by Motorola. Participating dignitaries included: NASA Administrator Daniel Goldin; Ted Kehl, Motorola's launch services manager for Iridium; Col. James Ledbetter, vice commander, USAF Phillips Laboratory; Ken Hampsten, SBIR program manager; Steve Jarvis, director of the Sate of California Office of Strategic Technology; and area Congressmen George E. Brown, Jr. (D-San Bernardino) and Jerry Lewis (R-Redlands). Brown, a former chair of the house Science Committee, is now its senior minority member. Lewis is chairperson of the House Appropriations sub-committee responsible for NASA funding. In addition, numerous members of the media covered the event, including the Lehr News Hour.

According to Jeff Finan, general manager for launch systems for Teledesic Corp., "Teledesic has always been interested in any an all approaches that will lower the cost of access to space. Emerging launch service companies, like Kelly Space & Technology, should be encouraged in their efforts to develop innovative approaches that reduce the cost of space transportation."